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08/937.721 09/25/97 GESSERT

NREL-96-48

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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MM31/1015

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MULPURI, S

EXAMINER

2812

ART UNIT

PAPER NUMBER

10/15/98

DATE MAILED:

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

08/93721

Applicant(s)

GESSERT

Examiner

S-MULPURI

Group Art Unit

2212

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

## Period for Response

A SHORTENED STATUTORY PERIOD FOR RESPONSE IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a response be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for response is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to respond within the set or extended period for response will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

## Status

- ☒ Responsive to communication(s) filed on 9/25/97.
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1-6 is/are pending in the application.  
Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-6 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

- ☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
  - ☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been received.
  - ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.
  - ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 2
- ☐ Interview Summary, PTO-413
- ☒ Notice of References Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☒ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other \_\_\_\_\_

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### DETAILED ACTION

1. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not understood what is meant by aperture of about 3 cm. Is it aperture diameter or radius or length or width. Clarification is requested.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art in combination with Schroen et al..

Admitted Prior Art discloses a method of making CDS/CdTe device. But does not disclose exposing the p-type CdTe to the Ar ions or atoms to reduce contact resistance. Schroen et al discloses evacuating residual gas to pressure of  $5 \times 10^{-7}$  Torr, providing Ar gas and creating Ar ion beam using glow discharge at 1000 volts and then exposing Ar ions to the doped semiconductor substrate and then forming ohmic contact. It would have been obvious to one of ordinary skill in the art to expose Ar ions to surface of CdTe to obtain low ohmic contact

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resistance. The mean free path in the invention of Schroen et al would have been same as claimed mean free path because the experimental conditions in Schroen et al are substantially same as instantly claimed conditions.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art in combination with Schroen et al as applied to claims 1-4 above, and further in view of Lee et al..

Neither admitted Prior Art nor Schroen et al disclose an aperture dimension. Lee et al disclose an aperture diameter of Ar plasma is 3 cm(see col.3, lines 35-63). It would have been obvious to one of ordinary skill in the art to use chamber having large aperture of 3 cm in the invention of Schroen et al.

because aperture size <sup>is</sup> suitable for the ion etching/ion cleaning on the surface of the substrate.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art in combination with Schroen et al as applied to claim s 1-4 above, and further in view of Ebe et al.

Neither Admitted Prior art nor Schroen et al disclose using angle implantation. Ebe et al disclose using exposing Ar ions at an angle of 45 degrees to substrate(see fig.4, col. 5, 60-67). It would have been obvious to one of ordinary skill in the art to use angle implantation in the invention of Schroen et al because Ebe et al teaches angle implantation is suitable for finally making integrated circuits. .

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The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Morita disclose angle implantation of Ar ions. Wotherspoon teaches etching of CdTe layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Mulpuri whose telephone number is (703) 305-5184. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

S. M

10/12/98



S. Mulpuri

Patent examiner

Technology center 2800